FIG.1

FIG.2

FIG. 3

A

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | kDa |

E-I → ———113.7
———80.9

E → ———37.4
———26.0

B

| 1 | 2 | 3 | 4 | kDa |

E-I → ———113.7
———80.9
I → ———63.8
———49.5

FIG. 4

A

B

FIG. 5

FIG. 6

A

B

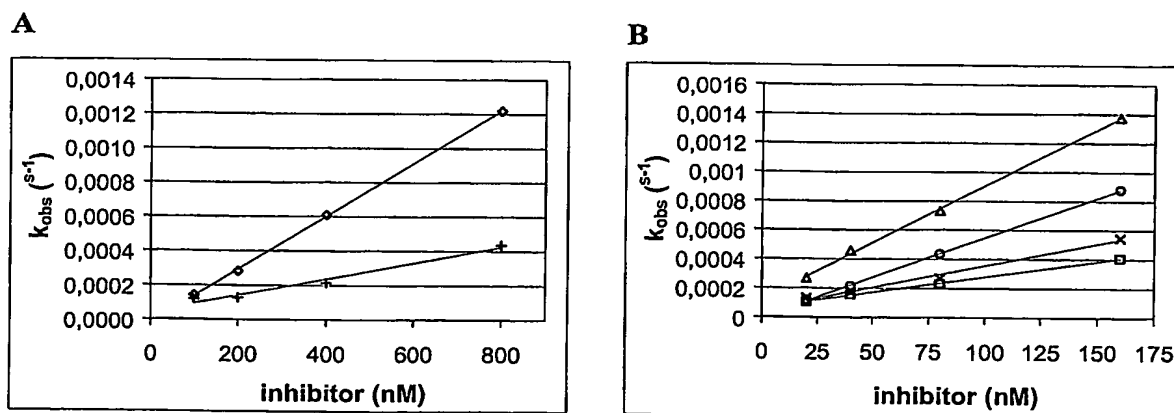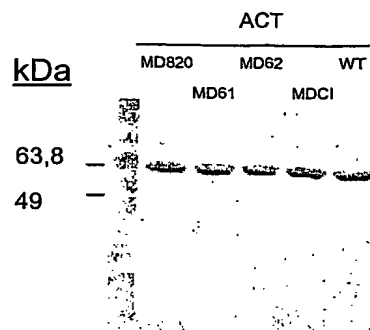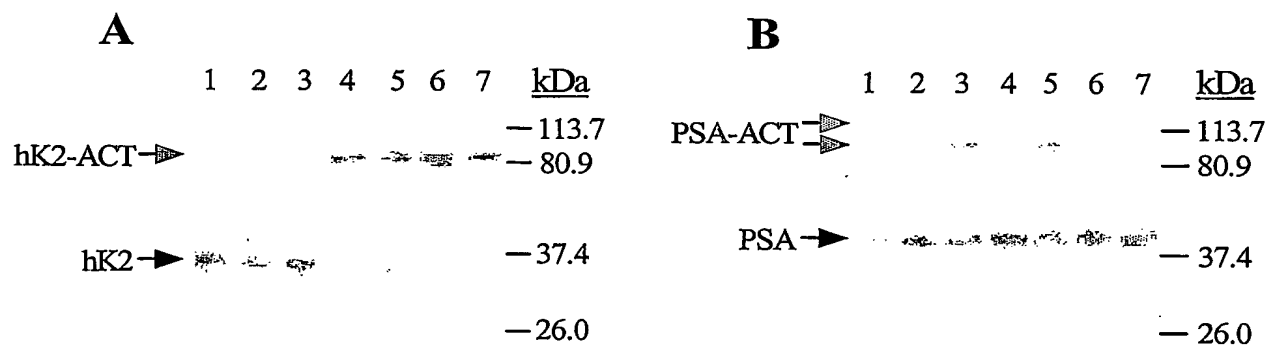## FIG. 7A

Italic : start codon ATG
Bold : His-tag
Underlined : DNA sequence different to ACTwt sequence
Underlined and grey : DNA sequence encoding RSL mutation.

DNA Sequence ACT variants : MD 820

SEQ ID N°1

*ATG*AGAGGATCCC**ATCACCATCACCATCAC**TCTAGACACCCTAACAGCCCACTTGACGAGGAGA
ATCTGACCCAGGAGAACCAAGACCGAGGGACACACGTGGACCTCGGATTAGCCTCCGCCAACGT
GGACTTCGCTTTCAGCCTGTACAAGCAGTTAGTCCTGAAGGCCCCTGATAAGAATGTCATCTTC
TCCCCACTGAGCATCTCCACCGCCTTGGCCTTCCTGTCTCTGGGGGCCCATAATACCACCCTGA
CAGAGATTCTCAAAGGCCTCAAGTTCAACCTCACGGAGACTTCTGAGGCAGAAATTCACCAGAG
CTTCCAGCACCTCCTGCGCACCCTCAATCAGTCCAGCGATGAGCTGCAGCTGAGTATGGGAAAT
GCCATGTTTGTCAAAGAGCAACTCAGTCTGCTGGACAGGTTCACGGAGGATGCCAAGAGGCTGT
ATGGCTCCGAGGCCTTTGCCACTGACTTTCAGGACTCAGCTGCAGCTAAGAAGCTCATCAACGA
CTACGTGAAGAATGGAACTAGGGGGAAAATCACAGATCTGATCAAGGACCTTGACTCGCAGACA
ATGATGGTCCTGGTGAATTACATCTTCTTTAAAGCCAAATGGGAGATGCCCTTTGACCCCCAAG
ATACTCATCAGTCAAGGTTCTACTTGAGCAAGAAAAAGTGGGTAATGGTGCCCATGATGAGTTT
GCATCACCTGACTATACCTTACTTCCGGGACGAGGAGCTGTCCTGCACCGTGGTGGAGCTGAAG
TACACAGGCAATGCCAGCGCACTCTTCATCCTCCCTGATCAAGACAAGATGGAGGAAGTGGAAG
CCATGCTGCTCCCAGAGACCCTGAAGCGGTGGAGAGACTCTCTGGAGTTCAGAGAGATAGGTGA
GCTCTACCTGCCAAAGTTTTCCATCTCGAGGGACTATAACCTGAACGACATACTTCTCCAGCTG
GGCATTGAGGAAGCCTTCACCAGCAAGGCTGACCTGTCAGGGATCACAGGGGCCAGGAACCTAG
CAGTCTCCCAGGTGGTCCATAAGGCTGTGCTTGATGTATTTGAGGAGGGCACAGAAGCATCTGC
TGCCACC<u>GCGGTCAAAATCACCCTCCG</u>TTCT<u>CGA</u>GCAGTGGAGACGCGTACCATTGTGCGTTTC
AACAGGCCCTTCCTGATGATCATTGT<u>C</u>CCTACAGACACCCAGAACATCTTCTTCATGAGCAAAG
TCACCAATCCCAAGCAAGCCTAA

Protein Sequence ACT variants : MD 820

SEQ ID N°2

MRGSHHHHHHSRHPNSPLDEENLTQENQDRGTHVDLGLASANVDFAFSLYKQLVLKAPDKNVIF
SPLSISTALAFLSLGAHNTTLTEILKGLKFNLTETSEAEIHQSFQHLLRTLNQSSDELQLSMGN
AMFVKEQLSLLDRFTEDAKRLYGSEAFATDFQDSAAAKKLINDYVKNGTRGKITDLIKDLDSQT
MMVLVNYIFFKAKWEMPFDPQDTHQSRFYLSKKKWVMVPMMSLHHLTIPYFRDEELSCTVVELK
YTGNASALFILPDQDKMEEVEAMLLPETLKRWRDSLEFREIGELYLPKFSISRDYNLNDILLQL
GIEEAFTSKADLSGITGARNLAVSQVVHKAVLDVFEEGTEASAATAVKITLR̲S̲R̲A̲VETRTIVRF
NRPFLMIIVPTDTQNIFFMSKVTNPKQA*

FIG. 7B

Italic : start codon ATG
Bold : His-tag
Underlined : DNA sequence different to ACTwt sequence
Underlined and grey : DNA sequence encoding RSL mutation.

DNA Sequence ACT variant : MD 62

SEQ ID N°3

*ATG*AGAGGATCC**CATCACCATCACCATCAC**TCTAGACACCCTAACAGCCCACTTGACGAGGAGA
ATCTGACCCAGGAGAACCAAGACCGAGGGACACACGTGGACCTCGGATTAGCCTCCGCCAACGT
GGACTTCGCTTTCAGCCTGTACAAGCAGTTAGTCCTGAAGGCCCCTGATAAGAATGTCATCTTC
TCCCCACTGAGCATCTCCACCGCCTTGGCCTTCCTGTCTCTGGGGGCCCATAATACCACCCTGA
CAGAGATTCTCAAAGGCCTCAAGTTCAACCTCACGGAGACTTCTGAGGCAGAAATTCACCAGAG
CTTCCAGCACCTCCTGCGCACCCTCAATCAGTCCAGCGATGAGCTGCAGCTGAGTATGGGAAAT
GCCATGTTTGTCAAAGAGCAACTCAGTCTGCTGGACAGGTTCACGGAGGATGCCAAGAGGCTGT
ATGGCTCCGAGGCCTTTGCCACTGACTTTCAGGACTCAGCTGCAGCTAAGAAGCTCATCAACGA
CTACGTGAAGAATGGAACTAGGGGGAAAATCACAGATCTGATCAAGGACCTTGACTCGCAGACA
ATGATGGTCCTGGTGAATTACATCTTCTTTAAAGCCAAATGGGAGATGCCCTTTGACCCCCAAG
ATACTCATCAGTCAAGGTTCTACTTGAGCAAGAAAAAGTGGGTAATGGTGCCCATGATGAGTTT
GCATCACCTGACTATACCTTACTTCCGGGACGAGGAGCTGTCCTGCACCGTGGTGGAGCTGAAG
TACACAGGCAATGCCAGCGCACTCTTCATCCTCCCTGATCAAGACAAGATGGAGGAAGTGGAAG
CCATGCTGCTCCCAGAGACCCTGAAGCGGTGGAGAGACTCTCTGGAGTTCAGAGAGATAGGTGA
GCTCTACCTGCCAAAGTTTTCCATCTCGAGGGACTATAACCTGAACGACATACTTCTCCAGCTG
GGCATTGAGGAAGCCTTCACCAGCAAGGCTGACCTGTCAGGGATCACAGGGGCCAGGAACCTAG
CAGTCTCCCAGGTGGTCCATAAGGCTGTGCTTGATGTATTTGAGGAGGGCACAGAAGCATCTGC
TGCCAC<u>C</u>GCGGTCAAAATCACC<u>AGGAGG</u>TCTATC<u>GAT</u>GTGGAGACG<u>C</u>GTACCATTGTGCGTTTC
AACAGGCCCTTCCTGATGATCATTGTCCCTACAGACACCCAGAACATCTTCTTCATGAGCAAAG
TCACCAATCCCAAGCAAGCCTAA

Protein Sequence ACT variant : MD 62

SEQ ID N°4

*MRGS*HHHHHHSRHPNSPLDEENLTQENQDRGTHVDLGLASANVDFAFSLYKQLVLKAPDKNVIF
SPLSISTALAFLSLGAHNTTLTEILKGLKFNLTETSEAEIHQSFQHLLRTLNQSSDELQLSMGN
AMFVKEQLSLLDRFTEDAKRLYGSEAFATDFQDSAAAKKLINDYVKNGTRGKITDLIKDLDSQT
MMVLVNYIFFKAKWEMPFDPQDTHQSRFYLSKKKWVMVPMMSLHHLTIPYFRDEELSCTVVELK
YTGNASALFILPDQDKMEEVEAMLLPETLKRWRDSLEFREIGELYLPKFSISRDYNLNDILLQL
GIEEAFTSKADLSGITGARNLAVSQVVHKAVLDVFEEGTEASAATAVKIT<u>RRS</u><u>ID</u>VETRTIVRF
NRPFLMIIVPTDTQNIFFMSKVTNPKQA*

FIG. 7C

Italic : start codon ATG
Bold : His-tag
Underlined : DNA sequence different to ACTwt sequence
Underlined and grey : DNA sequence encoding RSL mutation.

DNA Sequence ACT variant : MD 83

SEQ ID N°5

*ATG*AGAGGATCC**CATCACCATCACCATCAC**TCTAGACACCCTAACAGCCCACTTGACGAGGAGA
ATCTGACCCAGGAGAACCAAGACCGAGGGACACACGTGGACCTCGGATTAGCCTCCGCCAACGT
GGACTTCGCTTTCAGCCTGTACAAGCAGTTAGTCCTGAAGGCCCCTGATAAGAATGTCATCTTC
TCCCCACTGAGCATCTCCACCGCCTTGGCCTTCCTGTCTCTGGGGGCCCATAATACCACCCTGA
CAGAGATTCTCAAAGGCCTCAAGTTCAACCTCACGGAGACTTCTGAGGCAGAAATTCACCAGAG
CTTCCAGCACCTCCTGCGCACCCTCAATCAGTCCAGCGATGAGCTGCAGCTGAGTATGGGAAAT
GCCATGTTTGTCAAAGAGCAACTCAGTCTGCTGGACAGGTTCACGGAGGATGCCAAGAGGCTGT
ATGGCTCCGAGGCCTTTGCCACTGACTTTCAGGACTCAGCTGCAGCTAAGAAGCTCATCAACGA
CTACGTGAAGAATGGAACTAGGGGGAAAATCACAGATCTGATCAAGGACCTTGACTCGCAGACA
ATGATGGTCCTGGTGAATTACATCTTCTTTAAAGCCAAATGGGAGATGCCCTTTGACCCCCAAG
ATACTCATCAGTCAAGGTTCTACTTGAGCAAGAAAAGTGGGTAATGGTGCCCATGATGAGTTT
GCATCACCTGACTATACCTTACTTCCGGGACGAGGAGCTGTCCTGCACCGTGGTGGAGCTGAAG
TACACAGGCAATGCCAGCGCACTCTTCATCCTCCCTGATCAAGACAAGATGGAGGAAGTGGAAG
CCATGCTGCTCCCAGAGACCCTGAAGCGGTGGAGAGACTCTCTGGAGTTCAGAGAGATAGGTGA
GCTCTACCTGCCAAAGTTTTCCATCTCGAGGGACTATAACCTGAACGACATACTTCTCCAGCTG
GGCATTGAGGAAGCCTTCACCAGCAAGGCTGACCTGTCAGGGATCACAGGGGCCAGGAACCTAG
CAGTCTCCCAGGTGGTCCATAAGGCTGTGCTTGATGTATTTGAGGAGGGCACAGAAGCATCTGC
TGCCACCGCGGTCAAAATCAG<u>GGGGA</u>G̲A̲TCT<u>G̲A̲G</u>TTAGTGGAGACGCGTACCATTGTGCGTTTC
AACAGG<u>C</u>CCTTCCTGATGATCATTGTCCCTACAGACAC̲C̲CAGAACATCTTCTTCATGAGCAAAG
TCACCAATCCCAAGCAAGCCTAA

Protein Sequence ACT variant : MD 83

SEQ ID N°6

MRGSHHHHHHSRHPNSPLDEENLTQENQDRGTHVDLGLASANVDFAFSLYKQLVLKAPDKNVIF
SPLSISTALAFLSLGAHNTTLTEILKGLKFNLTETSEAEIHQSFQHLLRTLNQSSDELQLSMGN
AMFVKEQLSLLDRFTEDAKRLYGSEAFATDFQDSAAAKKLINDYVKNGTRGKITDLIKDLDSQT
MMVLVNYIFFKAKWEMPFDPQDTHQSRFYLSKKKWVMVPMMSLHHLTIPYFRDEELSCTVVELK
YTGNASALFILPDQDKMEEVEAMLLPETLKRWRDSLEFREIGELYLPKFSISRDYNLNDILLQL
GIEEAFTSKADLSGITGARNLAVSQVVHKAVLDVFEEGTEASAATAVKI<u>RGR</u>S̲E̲LVETRTIVRF
NRPFLMIIVPTDTQNIFFMSKVTNPKQA*

FIG. 7D

Italic : start codon ATG
Bold : His-tag
Underlined : DNA sequence different to ACTwt sequence
Underlined and grey : DNA sequence encoding RSL mutation.

DNA Sequence ACT variant : MD 67

SEQ ID N°7

*ATG*AGAGGATCC**CATCACCATCACCATCAC**TCTAGACACCCTAACAGCCCACTTGACGAGGAGA
ATCTGACCCAGGAGAACCAAGACCGAGGGACACACGTGGACCTCGGATTAGCCTCCGCCAACGT
GGACTTCGCTTTCAGCCTGTACAAGCAGTTAGTCCTGAAGGCCCCTGATAAGAATGTCATCTTC
TCCCCACTGAGCATCTCCACCGCCTTGGCCTTCCTGTCTCTGGGGGCCCATAATACCACCCTGA
CAGAGATTCTCAAAGGCCTCAAGTTCAACCTCACGGAGACTTCTGAGGCAGAAATTCACCAGAG
CTTCCAGCACCTCCTGCGCACCCTCAATCAGTCCAGCGATGAGCTGCAGCTGAGTATGGGAAAT
GCCATGTTTGTCAAAGAGCAACTCAGTCTGCTGGACAGGTTCACGGAGGATGCCAAGAGGCTGT
ATGGCTCCGAGGCCTTTGCCACTGACTTTCAGGACTCAGCTGCAGCTAAGAAGCTCATCAACGA
CTACGTGAAGAATGGAACTAGGGGGAAAATCACAGATCTGATCAAGGACCTTGACTCGCAGACA
ATGATGGTCCTGGTGAATTACATCTTCTTTAAAGCCAAATGGGAGATGCCCTTTGACCCCCAAG
ATACTCATCAGTCAAGGTTCTACTTGAGCAAGAAAAAGTGGGTAATGGTGCCCATGATGAGTTT
GCATCACCTGACTATACCTTACTTCCGGGACGAGGAGCTGTCCTGCACCGTGGTGGAGCTGAAG
TACACAGGCAATGCCAGCGCACTCTTCATCCTCCCTGATCAAGACAAGATGGAGGAAGTGGAAG
CCATGCTGCTCCCAGAGACCCTGAAGCGGTGGAGAGACTCTCTGGAGTTCAGAGAGATAGGTGA
GCTCTACCTGCCAAAGTTTTCCATCTCGAGGGACTATAACCTGAACGACATACTTCTCCAGCTG
GGCATTGAGGAAGCCTTCACCAGCAAGGCTGACCTGTCAGGGATCACAGGGGCCAGGAACCTAG
CAGTCTCCCAGGTGGTCCATAAGGCTGTGCTTGATGTATTTGAGGAGGGCACAGAAGCATCTGC
TGCCACCGCGGTCAAAATCA̲A̲G̲CTTAGAACA̲A̲CATTAGTGGAGACGCGTACCATTGTGCGTTTC
AACAGG̲C̲C̲C̲TTCCTGATGATCATTGTCCCTACAGACACCCAGAACA̲T̲C̲TTCTTCATGAGCAAAG
TCACCAATCCCAAGCAAGCCTAA

Protein Sequence ACT variant: MD 67

SEQ ID N°8

MRGSHHHHHHSRHPNSPLDEENLTQENQDRGTHVDLGLASANVDFAFSLYKQLVLKAPDKNVIF
SPLSISTALAFLSLGAHNTTLTEILKGLKFNLTETSEAEIHQSFQHLLRTLNQSSDELQLSMGN
AMFVKEQLSLLDRFTEDAKRLYGSEAFATDFQDSAAAKKLINDYVKNGTRGKITDLIKDLDSQT
MMVLVNYIFFKAKWEMPFDPQDTHQSRFYLSKKKWVMVPMMSLHHLTIPYFRDEELSCTVVELK
YTGNASALFILPDQDKMEEVEAMLLPETLKRWRDSLEFREIGELYLPKFSISRDYNLNDILLQL
GIEEAFTSKADLSGITGARNLAVSQVVHKAVLDVFEEGTEASAATAVKI̲K̲L̲R̲T̲T̲L̲VETRTIVRF
NRPFLMIIVPTDTQNIFFMSKVTNPKQA*

FIG. 7E

Italic : start codon ATG
Bold : His-tag
Underlined : DNA sequence different to ACTwt sequence
Underlined and grey : DNA sequence encoding RSL mutation.

DNA Sequence ACT variant : MD 61

SEQ ID N°9

*ATG*AGAGGATCC**CATCACCATCACCATCAC**TCTAGACACCCTAACAGCCCACTTGACGAGGAGA
ATCTGACCCAGGAGAACCAAGACCGAGGGACACACGTGGACCTCGGATTAGCCTCCGCCAACGT
GGACTTCGCTTTCAGCCTGTACAAGCAGTTAGTCCTGAAGGCCCCTGATAAGAATGTCATCTTC
TCCCCACTGAGCATCTCCACCGCCTTGGCCTTCCTGTCTCTGGGGGCCCATAATACCACCCTGA
CAGAGATTCTCAAAGGCCTCAAGTTCAACCTCACGGAGACTTCTGAGGCAGAAATTCACCAGAG
CTTCCAGCACCTCCTGCGCACCCTCAATCAGTCCAGCGATGAGCTGCAGCTGAGTATGGGAAAT
GCCATGTTTGTCAAAGAGCAACTCAGTCTGCTGGACAGGTTCACGGAGGATGCCAAGAGGCTGT
ATGGCTCCGAGGCCTTTGCCACTGACTTTCAGGACTCAGCTGCAGCTAAGAAGCTCATCAACGA
CTACGTGAAGAATGGAACTAGGGGGAAAATCACAGATCTGATCAAGGACCTTGACTCGCAGACA
ATGATGGTCCTGGTGAATTACATCTTCTTTAAAGCCAAATGGGAGATGCCCTTTGACCCCCAAG
ATACTCATCAGTCAAGGTTCTACTTGAGCAAGAAAAAGTGGGTAATGGTGCCCATGATGAGTTT
GCATCACCTGACTATACCTTACTTCCGGGACGAGGAGCTGTCCTGCACCGTGGTGGAGCTGAAG
TACACAGGCAATGCCAGCGCACTCTTCATCCTCCCTGATCAAGACAAGATGGAGGAAGTGGAAG
CCATGCTGCTCCCAGAGACCCTGAAGCGGTGGAGAGACTCTCTGGAGTTCAGAGAGATAGGTGA
GCTCTACCTGCCAAAGTTTTCCATCTCGAGGGACTATAACCTGAACGACATACTTCTCCAGCTG
GGCATTGAGGAAGCCTTCACCAGCAAGGCTGACCTGTCAGGGATCACAGGGGCCAGGAACCTAG
CAGTCTCCCAGGTGGTCCATAAGGCTGTGCTTGATGTATTTGAGGAGGGCACAGAAGCATCTGC
TGCCACCGCGGTCAAAATCATGACAAGATCTAACGCAGTGGAGACGCGTACCATTGTGCGTTTC
AACAGGCCCTTCCTGATGATCATTGTCCCTACAGACACCCAGAACATCTTCTTCATGAGCAAAG
TCACCAATCCCAAGCAAGCCTAA

Protein Sequence ACT variant : MD 61

SEQ ID N°10

MRGS**HHHHHH**SRHPNSPLDEENLTQENQDRGTHVDLGLASANVDFAFSLYKQLVLKAPDKNVIF
SPLSISTALAFLSLGAHNTTLTEILKGLKFNLTETSEAEIHQSFQHLLRTLNQSSDELQLSMGN
AMFVKEQLSLLDRFTEDAKRLYGSEAFATDFQDSAAAKKLINDYVKNGTRGKITDLIKDLDSQT
MMVLVNYIFFKAKWEMPFDPQDTHQSRFYLSKKKWVMVPMMSLHHLTIPYFRDEELSCTVVELK
YTGNASALFILPDQDKMEEVEAMLLPETLKRWRDSLEFREIGELYLPKFSISRDYNLNDILLQL
GIEEAFTSKADLSGITGARNLAVSQVVHKAVLDVFEEGTEASAATAVKIMTRSNAVETRTIVRF
NRPFLMIIVPTDTQNIFFMSKVTNPKQA*

FIG. 7F

Italic : start codon ATG
Bold : His-tag
Underlined : DNA sequence different to ACTwt sequence
Underlined and grey : DNA sequence encoding RSL mutation.

DNA Sequence ACT variants : MD 518

SEQ ID N°11

*ATG*AGAGGATCC**CATCACCATCACCATCAC**TCTAGACACCCTAACAGCCCACTTGACGAGGAGA
ATCTGACCCAGGAGAACCAAGACCGAGGGACACACGTGGACCTCGGATTAGCCTCCGCCAACGT
GGACTTCGCTTTCAGCCTGTACAAGCAGTTAGTCCTGAAGGCCCCTGATAAGAATGTCATCTTC
TCCCCACTGAGCATCTCCACCGCCTTGGCCTTCCTGTCTCTGGGGGCCCATAATACCACCCTGA
CAGAGATTCTCAAAGGCCTCAAGTTCAACCTCACGGAGACTTCTGAGGCAGAAATTCACCAGAG
CTTCCAGCACCTCCTGCGCACCCTCAATCAGTCCAGCGATGAGCTGCAGCTGAGTATGGGAAAT
GCCATGTTTGTCAAAGAGCAACTCAGTCTGCTGGACAGGTTCACGGAGGATGCCAAGAGGCTGT
ATGGCTCCGAGGCCTTTGCCACTGACTTTCAGGACTCAGCTGCAGCTAAGAAGCTCATCAACGA
CTACGTGAAGAATGGAACTAGGGGGAAAATCACAGATCTGATCAAGGACCTTGACTCGCAGACA
ATGATGGTCCTGGTGAATTACATCTTCTTTAAAGCCAAATGGGAGATGCCCTTTGACCCCCAAG
ATACTCATCAGTCAAGGTTCTACTTGAGCAAGAAAAAGTGGGTAATGGTGCCCATGATGAGTTT
GCATCACCTGACTATACCTTACTTCCGGGACGAGGAGCTGTCCTGCACCGTGGTGGAGCTGAAG
TACACAGGCAATGCCAGCGCACTCTTCATCCTCCCTGATCAAGACAAGATGGAGGAAGTGGAAG
CCATGCTGCTCCCAGAGACCCTGAAGCGGTGGAGAGACTCTCTGGAGTTCAGAGAGATAGGTGA
GCTCTACCTGCCAAAGTTTTCCATCTCGAGGGACTATAACCTGAACGACATACTTCTCCAGCTG
GGCATTGAGGAAGCCTTCACCAGCAAGGCTGACCTGTCAGGGATCACAGGGGCCAGGAACCTAG
CAGTCTCCCAGGTGGTCCATAAGGCTGTGCTTGATGTATTTGAGGAGGGCACAGAAGCATCTGC
TGCCACCGCGGTCAAAATCACCGAGCGTGTCTCGCCCGTGGAGACGCGTACCATTGTGCGTTTC
AACAGGCCCTTCCTGATGATCATTGTCCCTACAGACACCCAGAACATCTTCTTCATGAGCAAAG
TCACCAATCCCAAGCAAGCCTAA

Protein Sequence ACT variants: MD 518

SEQ ID N°12

MRGSHHHHHHSRHPNSPLDEENLTQENQDRGTHVDLGLASANVDFAFSLYKQLVLKAPDKNVIF
SPLSISTALAFLSLGAHNTTLTEILKGLKFNLTETSEAEIHQSFQHLLRTLNQSSDELQLSMGN
AMFVKEQLSLLDRFTEDAKRLYGSEAFATDFQDSAAAKKLINDYVKNGTRGKITDLIKDLDSQT
MMVLVNYIFFKAKWEMPFDPQDTHQSRFYLSKKKWVMVPMMSLHHLTIPYFRDEELSCTVVELK
YTGNASALFILPDQDKMEEVEAMLLPETLKRWRDSLEFREIGELYLPKFSISRDYNLNDILLQL
GIEEAFTSKADLSGITGARNLAVSQVVHKAVLDVFEEGTEASAATAVKITERVSPVETRTIVRF
NRPFLMIIVPTDTQNIFFMSKVTNPKQA*

FIG. 7G

Italic : start codon ATG
Bold : His-tag
Underlined : DNA sequence different to ACTwt sequence
Underlined and grey : DNA sequence encoding RSL mutation.

DNA Sequence ACT variants : MDCl

SEQ ID N°13

*ATG*AGAGGATCC**CATCACCATCACCATCAC**TCTAGACACCCTAACAGCCCACTTGACGAGGAGA
ATCTGACCCAGGAGAACCAAGACCGAGGGACACACGTGGACCTCGGATTAGCCTCCGCCAACGT
GGACTTCGCTTTCAGCCTGTACAAGCAGTTAGTCCTGAAGGCCCCTGATAAGAATGTCATCTTC
TCCCCACTGAGCATCTCCACCGCCTTGGCCTTCCTGTCTCTGGGGGCCCATAATACCACCCTGA
CAGAGATTCTCAAAGGCCTCAAGTTCAACCTCACGGAGACTTCTGAGGCAGAAATTCACCAGAG
CTTCCAGCACCTCCTGCGCACCCTCAATCAGTCCAGCGATGAGCTGCAGCTGAGTATGGGAAAT
GCCATGTTTGTCAAAGAGCAACTCAGTCTGCTGGACAGGTTCACGGAGGATGCCAAGAGGCTGT
ATGGCTCCGAGGCCTTTGCCACTGACTTTCAGGACTCAGCTGCAGCTAAGAAGCTCATCAACGA
CTACGTGAAGAATGGAACTAGGGGGAAAATCACAGATCTGATCAAGGACCTTGACTCGCAGACA
ATGATGGTCCTGGTGAATTACATCTTCTTTAAAGCCAAATGGGAGATGCCCTTTGACCCCCAAG
ATACTCATCAGTCAAGGTTCTACTTGAGCAAGAAAAGTGGGTAATGGTGCCCATGATGAGTTT
GCATCACCTGACTATACCTTACTTCCGGGACGAGGAGCTGTCCTGCACCGTGGTGGAGCTGAAG
TACACAGGCAATGCCAGCGCACTCTTCATCCTCCCTGATCAAGACAAGATGGAGGAAGTGGAAG
CCATGCTGCTCCCAGAGACCCTGAAGCGGTGGAGAGACTCTCTGGAGTTCAGAGAGATAGGTGA
GCTCTACCTGCCAAAGTTTTCCATCTCGAGGGACTATAACCTGAACGACATACTTCTCCAGCTG
GGCATTGAGGAAGCCTTCACCAGCAAGGCTGACCTGTCAGGGATCACAGGGGCCAGGAACCTAG
CAGTCTCCCAGGTGGTCCATAAGGCTGTGCTTGATGTATTTGAGGAGGGCACAGAAGCATCTGC
TGCCACCGCGGTCAAAATCACC͟T͟T͟TAGATCTGCATTAGTGGAGACGCGTACCATTGTGCGTTTC
AACAGGCCCTTCCTGATGATCATTGTCCCTACAGACACCCAGAACATCTTCTTCATGAGCAAAG
TCACCAATCCCAAGCAAGCCTAA

Protein Sequence ACT variants: MD Cl

SEQ ID N°14

*M*RGSH**HHHHH**SRHPNSPLDEENLTQENQDRGTHVDLGLASANVDFAFSLYKQLVLKAPDKNVIF
SPLSISTALAFLSLGAHNTTLTEILKGLKFNLTETSEAEIHQSFQHLLRTLNQSSDELQLSMGN
AMFVKEQLSLLDRFTEDAKRLYGSEAFATDFQDSAAAKKLINDYVKNGTRGKITDLIKDLDSQT
MMVLVNYIFFKAKWEMPFDPQDTHQSRFYLSKKKWVMVPMMSLHHLTIPYFRDEELSCTVVELK
YTGNASALFILPDQDKMEEVEAMLLPETLKRWRDSLEFREIGELYLPKFSISRDYNLNDILLQL
GIEEAFTSKADLSGITGARNLAVSQVVHKAVLDVFEEGTEASAATAVKI͟T͟F͟R͟S͟A͟LVETRTIVRF
NRPFLMIIVPTDTQNIFFMSKVTNPKQA*

FIG. 8

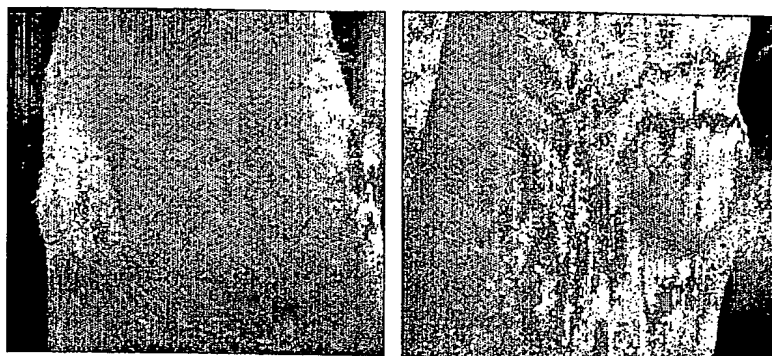| Serpin	Sequences	P6	P5	P4	P3	P2	P1	P'1	P'2	P'3	P'4	P'5
ACT_{WT}	Protein (a.a) SEQ ID N° 15	V	K	I	T	L	L*	S	A	L	V	E
	DNA (codon)	GTC	AAA	ATC	ACC	CTC	CTT	TCT	GCA	TTA	GTG	GAG
MD820	Protein (a.a) SEQ ID N° 16	V	K	I	T	L	R*	S	R	A	V	E
	DNA (codon)	GTC	AAA	ATC	ACC	CTC	CGT	TCT	CGA	GCA	GTG	GAG
MD62	Protein (a.a) SEQ ID N° 17	V	K	I	T	R	R*	S	I	D	V	E
	DNA (codon)	GTC	AAA	ATC	ACC	AGG	AGG	TCT	ATC	GAT	GTG	GAG
MD83	Protein (a.a) SEQ ID N° 18	V	K	I	R	G	R*	S	E	L	V	E
	DNA (codon)	GTC	AAA	ATC	AGG	GGG	AGA	TCT	GAG	TTA	GTG	GAG
MD67	Protein (a.a) SEQ ID N° 19	V	K	I	K	L	R*	T	T	L	V	E
	DNA (codon)	GTC	AAA	ATC	AAG	CTT	AGA	ACA	ACA	TTA	GTG	GAG
MD61	Protein (a.a) SEQ ID N° 20	V	K	I	M	T	R*	S	N	A	V	E
	DNA (codon)	GTC	AAA	ATC	ATG	ACA	AGA	TCT	AAC	GCA	GTG	GAG
MD518	Protein (a.a) SEQ ID N° 21	V	K	I	T	E	R*	V	S	P	V	E
	DNA (codon)	GTC	AAA	ATC	ACC	GAG	CGT	GTC	TCG	CCC	GTG	GAG
MDCI	Protein (a.a) SEQ ID N° 22	V	K	I	T	F	R*	S	A	L	V	E
	DNA (codon)	GTC	AAA	ATC	ACC	TTT	AGA	TCT	GCA	TTA	GTG	GAG

FIG. 9
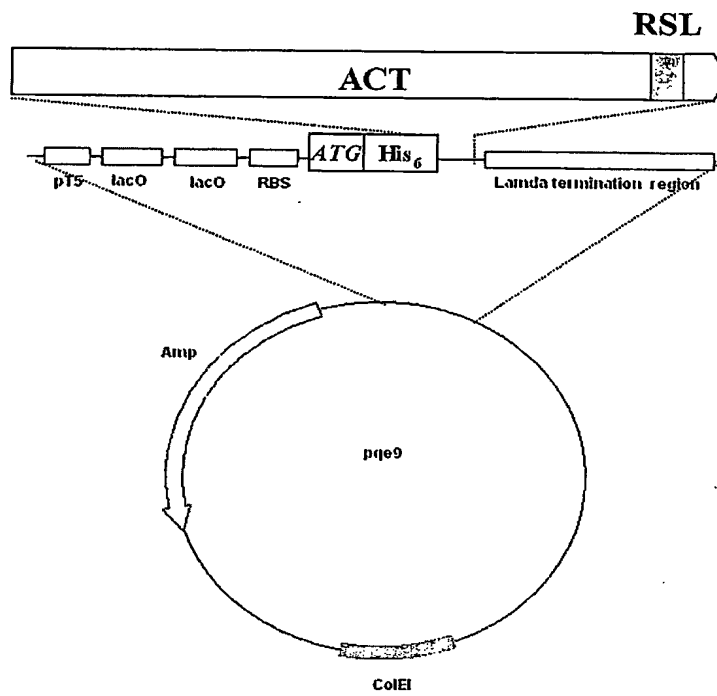
FIG. 10 A

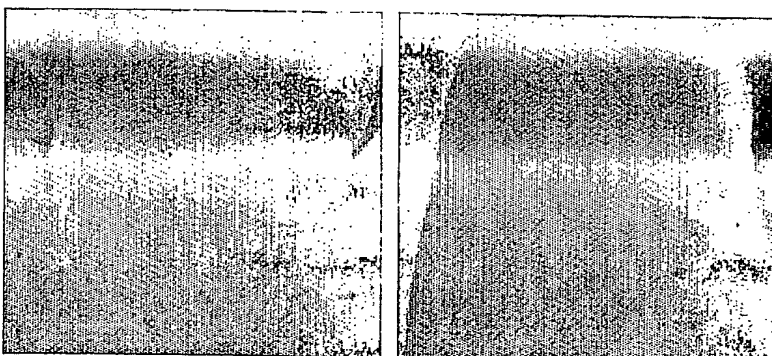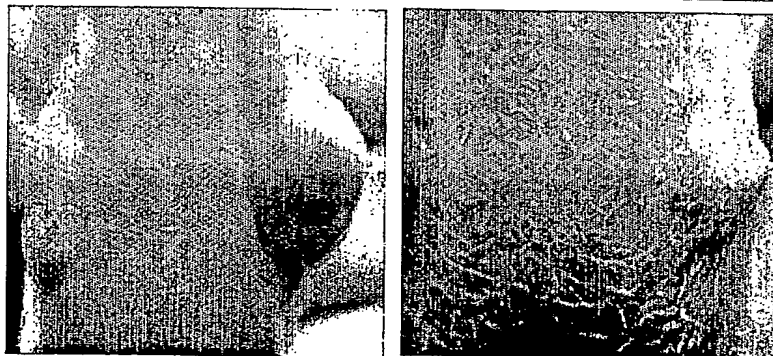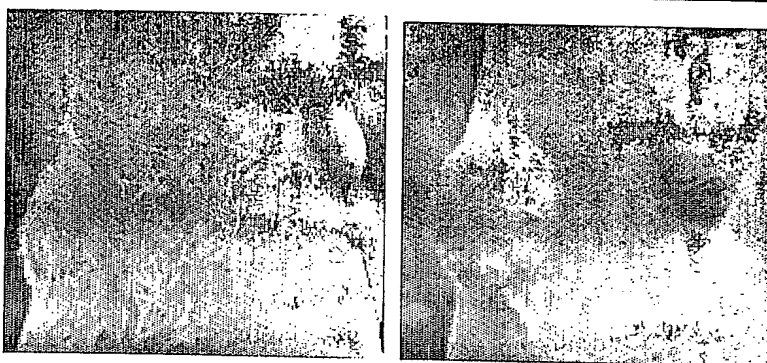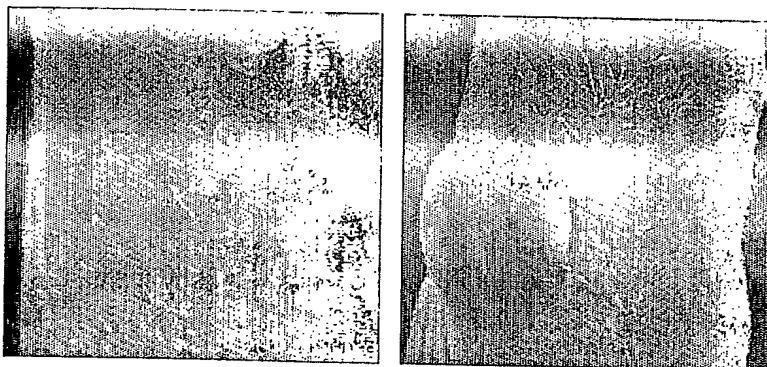Control

ACT-WT (50ug)

MD 62 (25ug)

MD 62 (5ug)

FIG. 10 B

Control

ACT-WT (50ug)

MD 67 (25ug)

MD 67 (5ug)
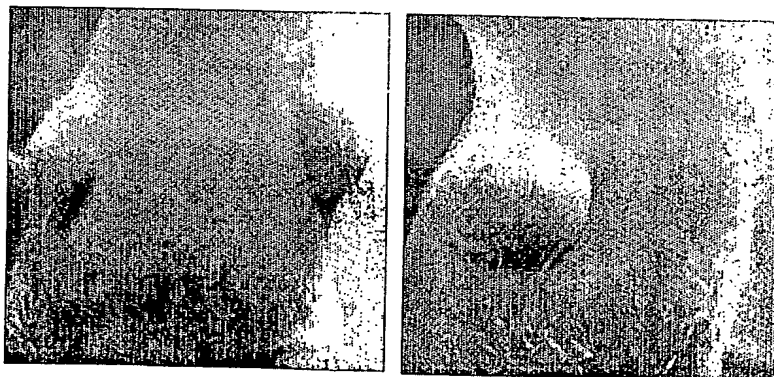
FIG. 11

Control

ACT-WT (50ug)

MD CI (50ug)
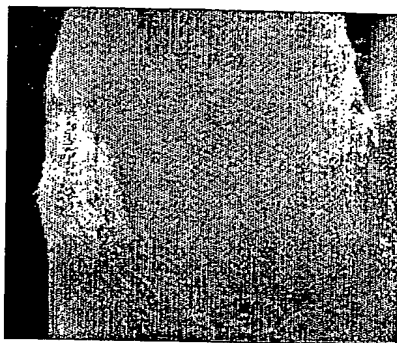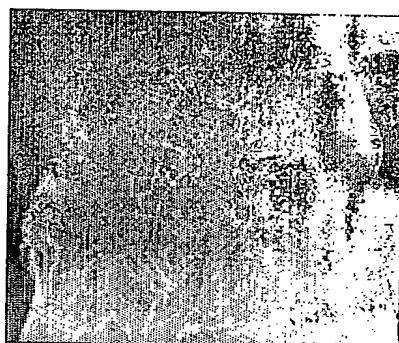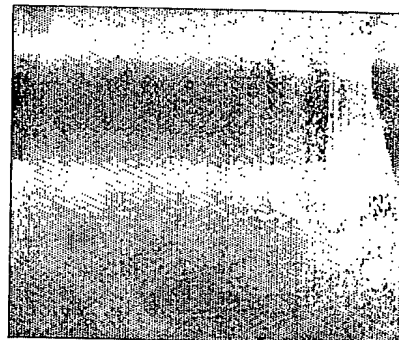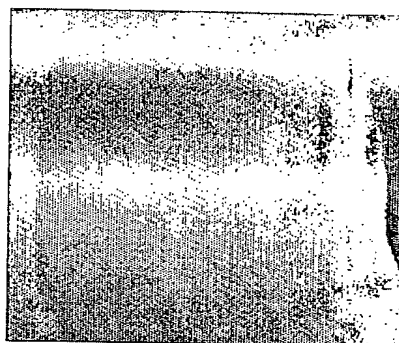
MD CI (5ug)